

CHAPTER 4

ENVIRONMENTAL CONSEQUENCES

RESOURCES NOT PRESENT OR NOT AFFECTED

The following resources were analyzed and found to be absent from the affected environment or not affected by the Proposed Action and action Alternatives: prime or unique farm lands, floodplains, Native American religious concerns, hazardous or solid wastes, and wild free-roaming horses and burros. No further analysis of these resources will be included in this chapter. In the case of Native American religious concerns and wild free-roaming horses and burros, Table 2.7 lists actions that will be taken to ensure that these resources will not be affected.

NO ACTION ALTERNATIVE

Air Resources

Under the No Action Alternative, there would be a greater chance of large wildfires that create more emissions, thus increasing overall emissions from fire. Air quality would deteriorate as a result of these fires. The No Action Alternative allows for only a very limited level of fuel treatments. Wildland fires would be suppressed, and limited prescribed fire would be allowed. More emissions would be put into the air during prescribed fires than if areas were treated mechanically or chemically prior to a prescribed fire.

The New Mexico Environment Department's Air Quality Bureau regulates smoke from all sources, including Federal, State, private and municipal sources. The Air Quality Bureau makes a daily airshed assessment based on the number of smoke management notifications received, the weather, current wildfires and wildland fire use fires, and smoke coming into New Mexico from other states, Tribal land, Bernalillo County, and Mexico. During the assessment process the Air Quality Bureau decides if the notified burns can proceed, need to reduce acreage burned, or need to be postponed. This decision is based on the amount of emissions projected to be generated in each airshed on a daily basis, and on a determination as to whether these emissions will violate the NAAQS.

Texas has an Outdoor Burning Regulation for which burners must notify the Texas Natural Resource Conservation Commission and the Texas Forest Service. Burners must follow weather and time restrictions and be aware of any downwind receptors.

Other impacts to air quality would continue at present levels, including noise, dust, and combustion engine exhaust generated by manual and mechanical treatment methods; aerial application of fire retardant; and moderate noise and minimal chemical drift from the application of herbicides. Resulting impacts would be temporary, small in scale, and quickly dispersed. These factors, combined with standard operating procedures, would minimize potential air quality impacts. Applicable Federal, State, Tribal and local air quality regulations would not be violated.

Soil Resources

Under the No Action Alternative, fire suppression would still be the primary response to wildland fires. The absence of fire could lead to an increase in fuel loading, which in turn would most often lead to increasing fire size and intensity in the long-term. As the intensity of fire increases, the severity and duration of impacts on soils would also increase. Recent examples in New Mexico include the Cerro Grande Fire of 2000, the Molina Complex Fire of 2003, and the Encebado Fire of 2003. Intense fires would remove most of the vegetative cover and organic matter, leaving soil more predisposed to large-scale, accelerated erosion. High-intensity fires could cause water repellent soil layers, which accelerate erosion and reduce plant-available moisture (Wells et al 1979). The degree of water repellency in soils is positively correlated with fire intensity. Therefore, the greater risk of high intensity fires under this Alternative would entail greater risk of negative long- and short-term impacts to soils. Soils would also be at risk under this Alternative from soil disturbance and compaction related to fire suppression activities such as fire line construction, road construction, and other uses of heavy equipment.

Water Resources

Under the No Action Alternative, impacts on water resources would remain the same as at present. These impacts would include the possibility of periodic influxes of increased sediment to streams after wildfires and deteriorating watershed conditions due to the encroachment of woody species in watersheds. Of these two impacts, the effects of watershed condition are more important to streams affected by public land. Past public land wildfires have not deposited excessive amounts of sediment into streams and lakes because the wildfires have been smaller and less intense than those that commonly cause post-fire sediment problems. Some improvements to watershed condition could be expected under the No Action Alternative; however the limited number of acres to be treated would result in relatively minor changes to existing water quality and water supply conditions. Any expected changes that would occur would only be on a very limited localized basis.

Vegetation Resources

Under the No Action Alternative, most wildfires would be suppressed in accordance with current Fire Management Plans and Resource Management Plans (RMPs). Periodic wildfires, including large stand replacement wildfires, would continue. The number of acres burned would increase in the future years following the trends shown in Tables 2.8 and Appendix A.4. Under the No Action Alternative, hazardous fuels would accumulate in the vegetation communities at rates similar to that of past years. This Alternative would have the greatest effect if landscapes with a Fire Regime Condition Class of 2 or 3 were not treated within the next 20 years. Stand replacement fires in these landscapes would have serious environmental consequences, with extensive resource damage and the need for extensive post-fire rehabilitation.

Under the No Action Alternative, forests and woodlands would trend towards over-dense conditions, leading to forest health problems associated with insects, disease, drought and fire. Without fire, ponderosa pine and pinyon-juniper would continue to invade grasslands and shrublands. Shrublands would increase in density and prevent the development of grasses. Non-native invasive plants would continue to increase in all communities. Treatment levels under this Alternative would be relatively low. Low treatment levels and fire suppression would lead to changes in the composition and structure of vegetation communities that eventually would lead to a loss of native plant diversity (Brown 2000).

Invasive and Noxious Weeds

The primary impact from continuing the current fire management practices under the No Action Alternative would be periodic high severity wildfire, which would contribute to the continued spread of invasive and noxious weeds (McAuliffe 1995, Brooks and Pyke 2001). Wildfire would leave a mosaic of the landscape devoid of vegetation. This situation would be conducive to the rapid colonization and establishment of invasive or noxious weeds. The continuance of weed establishment would be likely to occur on public land due to land use and development on adjoining private land. Once weeds are established, it is difficult for desirable vegetation to displace them without management intervention. Many weeds would contribute to hazardous fuel loads because the leaves and stems are highly flammable when dry (Brooks 2002). Once the weeds are sufficiently abundant the likelihood of fire would increase and the fire return interval would become more frequent, as is the case with cheatgrass (*Bromus tectorum*). Consequently, the Fire Regime Condition Class would continue to deteriorate.

Fish and Wildlife Resources

Under the No Action Alternative, few acres would be treated to reduce the risk of fire. The remaining high fuel loads would result in potentially higher severity fires than historically occurred. Severe wildfires would diminish the capacity of native species to survive or escape from fire and its effects. Severe wildland fire would cause damage to the habitat of terrestrial species; habitat would be slow to recover due to erosion and soil damage. Terrestrial species would move to avoid severe wildland fire, if possible, thus putting pressure on surrounding habitats. Individuals would be killed in fires.

The risk of severe wildland fire would be greater under this Alternative, and there would be more frequent and widespread use of fire suppression. Suppression operations could introduce fire retardant, aviation fuel, or lubricants into streams and wetlands; expose soils on steep slopes adjacent to streams during fire line construction; damage riparian vegetation and soils from use of heavy use of equipment off established roads; reduce natural stream flow during drafting and pumping; and damage vegetation and soils if fire camps are established in or adjacent to sensitive riparian areas. Although minimum impact suppression techniques have been developed, the primary objective during emergency suppression is to protect life and property. Because species and habitat protection is logically placed below protection of life and property, there would be no assurance that minimum impact suppression techniques could and would be followed.

Under the No Action Alternative, it is unlikely that resource objectives to return altered fish and wildlife habitats to a more desired condition, which includes desired vegetation structure and composition, could be achieved. Indirect effects to wildlife and fish habitats and populations from long-term changes in vegetation composition and structure caused by aggressive fire suppression and potentially catastrophic wildfires would continue. The potential for greater and long lasting environmental consequences would persist.

Special Status Species

Under the No Action Alternative, BLM would consult with the U.S. Fish and Wildlife Service (USFWS) as required under Section 7 of the Endangered Species Act (ESA) when proposed treatments "May Affect" threatened or endangered species. When catastrophic wildland fires occur, as is more likely under this Alternative, emergency fire suppression could damage the

habitat of special status species and may kill individuals, as described above under Fish and Wildlife Resources.

Cultural Resources

Impacts to cultural resource sites would be most likely to occur under the No Action Alternative. The direct effects of wildland fire, fire suppression and post-fire rehabilitation efforts would require on-the-spot responses with less opportunity to plan avoidance strategies. The limited fuel treatments proposed under this Alternative would reduce the effects of catastrophic fires for fewer archaeological or historic sites than any of the other Alternatives.

Paleontological Resources

Under the No Action Alternative, paleontological resources could be impacted, depending on the treatment method and the fossil resources occurring in a project area. If these factors are considered in the project planning process, impacts from fuels reduction treatments could be reduced or avoided. The low level of fuel reduction treatments under the No Action Alternative would create a greater potential for wildfire in areas specially designated for paleontological resource values.

Visual Resources

Under the No Action Alternative, the direction in most RMPs for management of risks and hazards of wildland fire would be suppression of unplanned ignitions. In general, the RMPs do not provide direction for management strategies to reduce the risk of wildland fire or rehabilitate areas after wildland fire has passed through an area. Therefore, trends of increased risk and hazard due to the accumulation of fuels would be likely to continue for all Visual Resource Management (VRM) classes. Wildland fires would be expected to increase in occurrence and severity, potentially burning and charring visually sensitive areas.

Special Designation Areas

The No Action Alternative would result in continuation of existing fire management direction. The only change would be the increasing risk of catastrophic wildland fire.

Land Uses

The primary impacts from continuing the current fire management practices under the No Action Alternative would be periodic disruption to livestock grazing, recreation, forestry, and mineral resources from catastrophic wildland fire, which would have varying impacts depending on land use. Disruptions to livestock grazing would be potentially greater than to other land uses, because frequently the BLM requires at least a two growing-season period of rest to allow desirable forage to re-establish after fire. Treatments under the No Action Alternative would eventually benefit livestock grazing by increasing forage on most sites treated, although these treatments would improve only a small portion of the landscape. In summary, the No Action Alternative would disrupt livestock grazing through the risk of catastrophic wildland fire; livestock overgrazing also disrupts historic fire regimes.

Under the No Action Alternative, disruptions of recreation would be likely to increase because of the increased risk of wildland fires. Disruption would vary in magnitude and duration depending

on the fire location, severity, aesthetics, vegetation recovery, and damage to facilities. Outdoor recreationists and tourists would contribute to wildfire risk on public land. Human caused fire is on the increase, probably in response to the increased number of visitors on public land and carelessness (Tables 2.8 and Appendix A.4). As the number of recreationists on public land increases, the risk of human-caused wildland fires would also be likely to increase.

Under the No Action Alternative, forestry resources would have an increased risk of being totally or partially lost to wildfire, and it would take decades for new-growth trees to attain commercial or ecological value. Increased wildland fire risk could impact mineral resources through disruption of transportation corridors and utilities, and damage to facilities. Under this Alternative, the Wildland Urban Interface (WUI) would increase as private land interspersed with public land continues to develop; and homes are constructed in woodlands and rangelands. The threat to WUI areas from catastrophic wildfire would continue to increase as the WUI areas themselves increase.

Socio-Economic Conditions

Under the No Action Alternative, fire suppression would continue, but the risk of catastrophic wildfires would increase. As shown in Tables 2.8 and Appendix A.4, it is expected that an average of 112 wildland fires would occur annually on BLM-administered public land in New Mexico, and an average of 25,316 acres would burn per year. Over time, wildfires would tend to grow larger in size, intensity, and severity due to unnatural fuel loading conditions. The primary impacts from continuing the current fire management practices would be risks to public and firefighter safety during fire suppression activities, loss of income from the destruction of resources (timber, pasture, businesses, etc.), fire suppression costs, watershed restoration costs, costs of health impacts (particularly from air or water quality effects), altered transportation patterns, altered sense of place, and impacts to subsistence activities. Under the No Action Alternative, protecting communities and private parcels from wildfire would become increasingly more difficult and expensive.

Catastrophic wildfires would burn with such intensity that the ecosystems would be drastically changed, as has occurred in New Mexico recently. Economic impacts would arise both directly from fire damage and indirectly from changes in local economic activity, such as a drop in tourism. Both direct and indirect effects of wildfires would exact a heavy economic toll on many communities. Wildland fires would burn both public and private lands over a broad spectrum of rangeland and forested ecosystems, often encompassing entire watersheds critical to community water supplies. These burned lands would be susceptible to the establishment of undesirable noxious weeds. The cost to eradicate unwanted invasive species such as cheatgrass, although unquantified, would be very large.

On the other hand, wildland firefighting would be a source of income for many small communities in New Mexico. Wildland fires would temporarily stimulate local economies through the influx of Federal and State funds, both during the fire and after the fire through rehabilitation activities.

Environmental Justice

Under the No Action Alternative, there would be no disproportionate impacts to minority or low-income populations.

Cumulative Impacts

Cumulative effects of the No Action Alternative would be an increase in the occurrence of severe wildland fires over the long-term, with accompanying deterioration of air quality through increased volume of smoke from these fires, damage to surface and groundwater resources, and soil erosion. The increased occurrence of severe wildland fires would result in long-term loss of native vegetation and decreased ability of vegetation to recover from fires, loss of wildlife habitat, and loss of forage for livestock. The increased need for fire suppression activities would result in increased damage to cultural and paleontological resources. Communities would benefit from economic activities related to fire suppression, but would suffer from economic losses due to resource damage and loss of income from recreation. The low level of treatments would improve small portions of the landscape over time.

PROPOSED ACTION

As stated in Chapter 2, the Proposed Action includes wildland fire use. Naturally occurring fires under prescribed conditions in Categories C and D would be used to achieve responsible and definable land use benefits and resource management objectives. As such, the environmental consequences of wildland fire use are expected to be similar to those of prescribed fire and are combined with prescribed fire in the descriptions of the Proposed Action, Mechanical Emphasis Alternative, and Fire Emphasis Alternative environmental consequences.

Air Resources

This Alternative would offer better protection for air quality than the No Action Alternative. Greatly increasing the level of fuels treatments would decrease the risk of large wildland fires and the emissions they produce. The Proposed Action would provide for a wide range of treatments to consider and evaluate for achieving minimum emissions. By offering options for biomass disposal and reduction other than fire, emissions would be averted. These kinds of actions would support the Regional Haze Rule in the use of alternatives to fire and the use of emission reduction techniques (chemical, biological, and mechanical). The Regional Haze Rule requires states to show reasonable progress to the Environmental Protection Agency in emissions reductions over time, and this Alternative would provide a reduction in emissions produced from fire.

Soil Resources

Compared with the No Action Alternative, direct impacts to soil from fire suppression activities would be greatly decreased under the Proposed Action. The number of acres burned by wildfires, the severity of those fires, and the acres needing rehabilitation would be much lower under the Proposed Action, especially on Fire Management Category B and C acres.

Many more acres would be treated with prescribed fire and wildland fire use than under the No Action Alternative. Prescribed fire or wildland fire use could decrease soil permeability, especially if prescriptions are at higher intensity or when there is long duration of slash pile burning. However, heat from prescribed fire would have a temporary sterilization effect that could influence plant growth (Wells et al 1979). Under this Alternative, the mechanical removal of fuels prior to prescribed burning or prescribed burns timed to coincide with a proper prescription would produce lower temperature fires, thus fewer direct and indirect impacts on soils.

There would be an increase in mechanical treatments under this Alternative. Heavy equipment used for mechanical fuels treatments could increase soil compaction, slowing the re-establishment of vegetative cover. Chemical treatments employed to reduce shrub components could leave residues that can alter soil microbial populations or vegetative recovery, affecting the productivity of the soil and increasing the susceptibility of erosion. However, over time, fewer mechanical and chemical treatments would be needed to reduce fuel loading.

Water Resources

With the greater number of total acres treated under the Proposed Action, there would be a greater chance of short-term impacts to water quality under this Alternative than under the No Action Alternative. These short-term impacts would include the possibility of increased runoff due to compaction of soils from mechanical equipment and from the lack of vegetative cover. Greater volumes of sediments would be moved from treatment areas and intervening watersheds into streams and lakes. Accidents resulting from the use of chemical treatments could occur, which might affect surface and groundwater quality and downstream water uses. While these short-term impacts have a greater potential to occur because of the larger treatment area involved, impacts would be minimized and avoided if site-specific Best Management Practices (BMPs) were implemented.

The potential for long-term beneficial impacts to overall watershed condition would improve over the current situation under this Alternative. Overall, watershed conditions would likely improve through the removal of undesirable woody vegetation, lessening the chances of uncontrolled wildfire and promoting savannah or grassland vegetation types. While watershed conditions would be expected to improve on public land, it is not expected that measurable changes to water quality or water yield in downstream perennial streams would result. BLM public land condition changes would not have a measurable change on State-listed impaired waters because the waters are usually minimally affected by public land. Numerous other factors than the watershed condition on public land would affect the attainment of water quality in these streams.

Measurable changes in water yield would not be expected, as the majority of treatments on public land would be in areas of lower precipitation not likely to enhance perennial stream flows. Branson, Gifford, Renard and Hadley (1981) discuss many studies of the effects of vegetation conversions on water yield. One study they discuss concluded that areas receiving less than 20 inches of precipitation annually have limited potential for water yield increases regardless of the vegetation type. Another factor related to water yield enhancement is that the treatments most likely to generate measurable water yield increases are those designed to result in the greatest amounts of bare ground. In the treatments planned under the Proposed Action, promotion of bare ground is not a desired treatment result.

Vegetation Resources

Under the Proposed Action, treatments in various combinations would be conducted on more than four times the acres than under the No Action Alternative. The key component of the Proposed Action would be the combination of any fuels management technique (wildland fire use, prescribed fire, mechanical treatment, chemical treatment, or biological treatment) on any fuel type, to meet fire and fuels management objectives. Under this Alternative, after treatments and the use of wildland fire are implemented over the next 20 years, Fire Regime Condition Class on most landscapes treated would approach desired conditions. As desired conditions

are achieved, there would be fewer impacts on vegetation communities from catastrophic wildfires.

Prescribed fire would be the primary tool used to achieve hazardous fuels reduction on most of the grasslands. Many of the grass species are fairly fire resistant and can produce new shoot growth following burns. Prescribed burns can release understory plants present in shrubland communities. Most grassland plants that survive a fire can return to pre-burn coverage and production within 2 years (West and Hassan 1985). The recovery time could be shorter or much longer, depending on the amount of damage sustained by the plant, its recovery potential, site productivity, post-fire weather, and post-fire animal use. For example, black grama (*Bouteloua eriopoda*) can be damaged or stimulated by fire, depending on timing, severity of burn, and precipitation (Ahlstrand 1982). Prescribed burn projects would be planned to allow for the recovery of key plant species, and would be scheduled during periods of higher soil and fuel moisture, higher relative moisture, and lower temperatures. In contrast, wildland fires would typically occur during late spring and summer months, when soil and fuel moisture are lower, and temperatures are higher, thus potentially causing greater damage to vegetation.

Mechanical treatments and prescribed fire would be used in woodlands and forests to reduce plant density, reduce ladder fuels, and improve overall forest and woodland health. The understories of ponderosa pine and pinyon-juniper are all adapted to fire. Some later seral species that may have established because of fire exclusion might not be favored, but the natural shrub, forb, and grass associates of these species would recover by sprouting or from seed stored in the forest or woodland soil organic layer after fire. Prescribed fire in conjunction with mechanical treatments could be used to reduce the density of these trees when they are young. Burning could easily kill nonsprouting juniper, especially trees less than 4 feet tall (Dwyer and Pieper 1967). Older trees would be generally more fire resistant as bark thickens and the crown becomes more open; they could survive low intensity fires. Many woodland and forest stands would need a mechanical treatment initially before fire is re-introduced. It is difficult to use fire in dense stands, especially when there are insufficient fine fuels to conduct underburning. Mechanical treatment would create a fire surrogate, initially to selectively remove trees and shrubs, followed by prescribed fire to keep the site productive and remove slash generated from treatments. Mechanical treatments would also result in increased sunlight, increased soil moisture, and decreased needle mat, which would stimulate the growth of understory plants.

The direct effect on vegetation from mechanical, fire and chemical treatment combinations would primarily be short-term and temporary and would be in the form of soil erosion, inadvertent damage to habitat, and damage to desirable plants. However, vegetation is resilient and recovery would be fast. Fuels reduction treatments would be needed to maintain and sustain the normal range of variability. The removal of diseased, invasive, and overstocked plants would encourage the growth of healthy forest and rangeland vegetation.

Invasive and Noxious Weeds

Under the Proposed Action, Fire Regime Condition Class 1 or the desired future conditions would eventually be achieved, over a period of several decades. As the Desired Future Condition is achieved, weed invasion into new areas in response to high severity fire would decrease. Weed control would be aggressively implemented to reduce the risk of wildfire in WUI areas and to improve public land health. The immediate direct affect of this Alternative would be the reduction of hazardous, highly flammable fuels. Over the long-term, this action

would reduce and replace weed populations and non-native plants with desirable, less flammable native vegetation.

Hazardous fuel reduction projects targeted at weeds or non-native vegetation would reduce the total infested acreage. Invasive or noxious weed control to reduce fire hazard could occur by a variety of ways including biological, chemical, prescribed fire, mechanical or a combination of techniques (Howey and Ruyle 2002). Encouraging the growth and productivity of desirable vegetation would most likely inhibit the re-establishment of invasive plants. The vegetation communities would eventually return to a normal composition, structure and productivity, which in turn, would affect the nature and severity of fires. The ability of invasive species to become established would decrease as the desirable plant competition for space, light, nutrients, and water increases. The occurrence of catastrophic wildfire would decrease as vegetation communities achieve their normal composition, structure and productivity.

Fish and Wildlife Resources

Under the Proposed Action, BLM would use a variety of treatments, with the flexibility to adjust the percentage of treatment types, to reduce hazardous fuels and improve rangeland and woodland health. The treatments would have a variety of direct effects on the resident fish and wildlife species. Adverse impacts would be lessened for some species if the timing of the prescribed fire or vegetation treatment avoids critical seasons, such as reproductive periods, when the loss of cover would be critical to wildlife or fish (for example, the bird nesting season or wet weather conditions that may increase runoff into aquatic habitats).

Fish and wildlife species occupying particular sites would experience repeated direct effects from various treatments, particularly prescribed burning and mechanical treatments, since these activities would need to be repeated periodically to maintain reduced fuel loads or retain particular resource objectives or conditions. However, as the Fire Regime Condition Class of vegetative communities improves, the intensity and scope of these effects would be reduced, as habitat conditions are restored and fuel loads are minimized and stabilized. The removal of vegetation to reduce future fuel loads would be accomplished with minimal impacts in some areas, but in others, sensitivity to ground disturbance from loss of vegetation could cause increased erosion, compacted soils, and a loss of nutrients (USDA 2000). Fuels management activities that increase the probability of chronic sediment inputs to aquatic systems would pose greater threats to fish, amphibians and aquatic ecosystem integrity than natural events associated with undesired vegetation conditions (Frissell and Bayles 1996). However, careful planning of treatments and use of BMPs could avoid impacts to aquatic systems.

Under the Proposed Action, chemical treatments would be conducted primarily on dryland environments to reduce shrubs or non-native plants. The introduction of a variety of chemicals into streams and wetlands would result in acute and chronic toxicity to aquatic species. BMPs would reduce the likelihood of introducing chemicals that may be toxic.

Prescribed fire and wildland fire use would generally change vegetation communities to lower seral stages. Forest and woodlands would change to forest and woodland overstory/grass understory; treated shrublands would change to grass/forb communities. Wildlife adapted to lower seral stage habitats would benefit and possibly increase. Effects on wildlife from fire management would depend on the timing, intensity, and vegetative species burned. Prescribed burning and wildland fire use would change forage quality and quantity, intersperse new feeding areas with areas providing cover, and rejuvenate decadent browse plants.

Creating a mosaic of successional stages with prescribed burning could benefit wildlife (Severson and Medina 1984). In the Chihuahuan Desert, wildlife numbers appear higher on lands in the mid-seral stage or mixture of grass and shrubs (Nelson, Holechek, and Valdez 1999). Periodic burning would be desirable to maintain ideal Lesser Prairie Chicken habitat in tall grass prairie, but burned areas would not be preferred habitat for sharp-tailed grouse for several years post-fire (Wright and Bailey 1982). Eventually, the application of prescribed fire on more acres would reduce the likelihood of wildland fire and the associated impacts on wildlife. The Proposed Action would restore a more natural habitat to fire adapted wildlife to a greater extent than the No Action Alternative. The Proposed Action would utilize mechanical treatments on 40 percent of the treated acres; mechanical treatments have the advantage of being highly selective, and impacts to wildlife could be minimized through properly designed treatment plans. This Alternative would allow the flexible use of properly designed treatments to enhance wildlife and species diversity by creating edge effect. Any improvement of vegetative communities that increases structural and species diversity would indirectly benefit wildlife.

Special Status Species

In accordance with Section 7(a) 2 of the Endangered Species Act (ESA) of 1973, as amended, the Bureau of Land Management (BLM), New Mexico State Office, requested informal consultation for the Fire and Fuels Management Land Use Plan Amendment and Environmental Assessment (EA) for Public Land in New Mexico and Texas. The EA considered prescribed fire and wildland fire use for resource benefit, mechanical, chemical, and biological treatments. A Biological Evaluation (BE) was prepared that provided detailed analysis of all Federally listed (threatened and endangered), proposed and candidate species, as well as designated or proposed critical habitat, that may be affected by the Proposed Action. All anticipated environmental effects (direct and indirect) including any interrelated and interdependent actions are included in the BE. The Proposed Action analyzed in the BE would amend nine existing Resource Management Plans in New Mexico and Texas (Carlsbad, Farmington, Mimbres, Rio Puerco, Roswell, Socorro, Taos, Texas, and White Sands).

The general and species-specific conservation measures that were developed as part of the BE will be implemented as part of the Proposed Action to minimize or eliminate adverse effects to Federally-protected species occurring within the action area, as detailed in Appendix C. These conservation measures will be implemented during all fuel treatment activities (prescribed fire, wildland fire use, non-fire fuels treatments). In addition, all conservation measures will be implemented during wildland fire suppression activities to the greatest extent possible.

Emergency consultation with the Fish & Wildlife Service (FWS) will be necessary after wildland fire suppression activities where Federally protected species or their habitats occur.

There are 58 Federally listed (threatened and endangered), proposed and candidate species that are known or potentially could occur on public land within New Mexico and Potter County, Texas (listed in Appendix C). These 58 Federally-protected species can be grouped as follows: 7 mammals, 8 birds, 14 fish, 2 amphibians, 2 reptiles, 12 invertebrates, and 13 flowering plants.

Based on discussions and analyses during informal consultation, including the development of conservation measures, determinations were made that the Proposed Action would have a "May Affect-Not Likely to Adversely Affect" for 30 species and a "No Affect" for the remaining 28 species (Table 4.1). The USFWS as part of the informal consultation process reviewed and concurred with all BLM "May Affect-Not Likely to Adversely Affect" determinations.

TABLE 4.1 FEDERALLY LISTED (THREATENED AND ENDANGERED), PROPOSED AND CANDIDATE SPECIES IN NEW MEXICO/TEXAS ANALYZED IN THE BIOLOGICAL EVALUATION				
COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS ^A	CRITICAL HABITAT ^A	AFFECT DETERMINATION
REPTILES and AMPHIBIANS				
1. Chiricahua leopard frog	<i>Rana chiricahuensis</i>	T	No	NLAA
2. New Mexico ridge-nosed rattlesnake	<i>Crotalus willardi obscurus</i>	T	No	NLAA
3. Sand dune lizard	<i>Sceloporus arenicolus</i>	C	No	NA
4. Boreal western toad	<i>Bufo boreas boreas</i>	C	No	NLAA
BIRDS				
5. Bald eagle	<i>Haliaeetus leucocephalus</i>	T	No	NLAA
6. Interior least tern	<i>Sterna antillarum</i>	E	No	NLAA
7. Northern aplomado falcon	<i>Falco femoralis septentrionalis</i>	E	No	NLAA
8. Piping plover	<i>Charadrius melodus</i>	T	No	NLAA
9. Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	E	Yes	NLAA
10. Mexican spotted owl	<i>Strix occidentalis lucida</i>	T	Yes	NLAA
11. Yellow-billed cuckoo	<i>Coccyzus americanus</i>	C	No	NLAA
12. Lesser prairie chicken	<i>Tympanuchus pallidicinctus</i>	C	No	NA
FISH				
13. Rio Grande silvery minnow	<i>Hybognathus amarus</i>	E	Yes	NLAA
14. Gila trout	<i>Oncorhynchus gilae</i>	E	No	NA
15. Loach minnow	<i>Tiaroga cobitis</i>	T	Yes	NLAA
16. Spikedace	<i>Meda fulgida</i>	T	Yes	NLAA
17. Gila chub	<i>Gila intermedia</i>	PE	PCH	NA
18. Pecos gambusia	<i>Gambusia nobilis</i>	E	No	NA
19. Pecos bluntnose shiner	<i>Notropis simus pecosensis</i>	T	Yes	NLAA
20. Arkansas River shiner	<i>Notropis girardi</i>	T	No	NLAA
21. Gila topminnow	<i>Poeciliopsis occidentalis</i>	E	No	NA
22. Beautiful shiner	<i>Cyprinella formosa</i>	T	No	NA
23. Chihuahua chub	<i>Gila nigrescens</i>	T	No	NA
24. Colorado pikeminnow	<i>Ptychocheilus lucius</i>	E	Yes	NLAA
25. Razorback sucker	<i>Xyrauchen texanus</i>	E	Yes	NLAA
26. Zuni bluehead sucker	<i>Catostomus discobolus yarrowi</i>	C	No	NA
PLANTS				
27. Zuni fleabane	<i>Erigeron rhizomatus</i>	T	No	NA
28. Kuenzler hedgehog cactus	<i>Echinocereus fendleri</i> var. <i>kuenzleri</i>	E	No	NA
29. Pecos sunflower	<i>Helianthus paradoxus</i>	T	No	NLAA
30. Sneed pincushion cactus	<i>Coryphantha sneedii</i> var. <i>sneedii</i>	E	No	NA
31. Gypsum wild-buckwheat	<i>Eriogonum gypsophilum</i>	T	Yes	NA
32. Lee pincushion cactus	<i>Coryphantha sneedii</i> var. <i>leei</i>	T	No	NLAA
33. Sacramento prickly poppy	<i>Argemone pleiacantha</i> ssp. <i>pinnatisecta</i>	E	No	NLAA

TABLE 4.1 FEDERALLY LISTED (THREATENED AND ENDANGERED), PROPOSED AND CANDIDATE SPECIES IN NEW MEXICO/TEXAS ANALYZED IN THE BIOLOGICAL EVALUATION				
COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS ^A	CRITICAL HABITAT ^A	AFFECT DETERMINATION
34. Todsen's pennyroyal	<i>Hedeoma todsenii</i>	E	Yes	NLAA
35. Knowlton cactus	<i>Pediocactus knowltonii</i>	E	No	NLAA
36. Mancos milk-vetch	<i>Astragalus humillimus</i>	E	No	NLAA
37. Sacramento Mountains thistle	<i>Cirsium vinaceum</i>	T	Yes	NA
38. Mesa Verde cactus	<i>Sclerocactus mesae-verdae</i>	T	No	NLAA
39. Holy Ghost ipomopsis	<i>Ipomopsis sancti-spiritus</i>	E	No	NA
MAMMALS				
40. Black-footed ferret	<i>Mustela nigripes</i>	E	No	NA
41. Jaguar	<i>Panthera onca</i>	E	No	NLAA
42. Lesser long-nosed bat	<i>Leptonycteris curasoae yerbabuenae</i>	E	No	NLAA
43. Mexican long-nosed bat	<i>Leptonycteris nivalis</i>	E	No	NLAA
44. Mexican gray wolf	<i>Canis lupus baileyi</i>	E, 10(j)	No	NLAA
45. Canada lynx	<i>Lynx canadensis</i>	T	No	NLAA
46. Black-tailed prairie dog	<i>Cynomys ludovicianus</i>	C	No	NLAA
INVERTEBRATES				
47. Koster's springsnail	<i>Juturnia kosteri</i>	PE	PCH	NA
48. Pecos assiminea snail	<i>Assiminea pecos</i>	PE	PCH	NA
49. Roswell pyrg (springsnail)	<i>Pyrgulopsis roswellensis</i>	PE	PCH	NA
50. Noel's amphipod	<i>Gammarus desperatus</i>	PE	PCH	NA
51. Sacramento Mountains checkerspot butterfly	<i>Euphydryas anicia cloudcrofti</i>	PE	No	NA
52. Alamosa springsnail	<i>Psuedotryonia alamosae</i>	E	No	NA
53. Socorro isopod	<i>Thermosphaeroma thermophilus</i>	E	No	NA
54. Socorro pyrg (spingsnail)	<i>Pyrgulopsis neomexicana</i>	E	No	NA
55. Gila pyrg (springsnail)	<i>Pyrgulopsis gilae</i>	C	No	NA
56. Texas hornshell (mussel)	<i>Popenaias popei</i>	C	No	NA
57. New Mexico pyrg (springsnail)	<i>Pyrgulopsis thermalis</i>	C	No	NA
58. Chupadera pyrg (springsnail)	<i>Pyrgulopsis chupaderae</i>	C	No	NA

NOTES:

^a Federal status designations are Endangered (E), Threatened (T), Proposed Endangered (PE), Proposed Threatened (PT), Federal Candidate (C), Designated Critical Habitat (Yes or No), Proposed Critical Habitat (PCH).

^b Species listed as "10(j)" are designated experimental/non-essential populations under Section 10(j) of the Endangered Species Act, as amended. This designation provides greater management flexibility. For BLM, 10(j) populations of Federally listed species are equivalent to a "proposed" status.

NLAA=May Affect, Not likely Adversely Affect

NA=No Affect

The Biological Evaluation can be reviewed at any BLM New Mexico Field Office (Albuquerque, Taos, Farmington, Socorro, Las Cruces, Roswell, Carlsbad, and Amarillo) and the New Mexico State Office in Santa Fe.

Cultural Resources

Impacts to cultural resource sites would be much less likely to occur under the Proposed Action than under the No Action Alternative. The Proposed Action would require that impacts on cultural resource sites must be considered in the treatment planning process. Cultural resource inventories of proposed treatment areas would be conducted and appropriate avoidance or mitigation strategies incorporated to prevent impacts to sites. Implementation of fuel reduction treatments in the vicinity of vulnerable site areas would reduce the potential for wildland fires on a long-term basis. The flexibility in selecting treatment methods would allow consideration of cultural resource values in tailoring projects to provide for the least potential impacts and the maximum long-term benefits.

Paleontological Resources

The variety of treatments proposed under the Proposed Action would allow the most flexibility in designing project specific measures to reduce or avoid impacts to paleontological resources. In areas with known fossil resources, these deposits would be avoided. In geological deposits with a high potential for paleontological localities, pre- and post-treatment inspections would be conducted to identify these resources and reduce impacts.

Visual Resources

The Proposed Action would provide vegetation treatment strategies that are consistent with managing scenic quality on public land. Non-fire fuels treatments, such as thinning and selective cutting, could be implemented to reduce hazardous fuels with little apparent changes to the character or scenic quality of the treatment area. Vegetation treatments using prescribed fire could result in more visual impact on the landscape than non-fire vegetation treatments. Over the short-term, the prescribed burn treatment areas and wildland fire use areas would be blackened, woody debris would be charred, and during treatment, smoke would reduce visibility. As such, the goal of allowing fire to resume a more natural ecological role across the landscape constitutes a short-term conflict between ecological sustainability and scenic aesthetics. Resource values and short-term visual impacts versus long-term benefits to the visual character of the landscape would have to be considered in the Fire Management Plans. VRM classes II and I are at the same time the most “natural” and the most sensitive to visual impact.

Relatively more aggressive fuels treatment would be allowed in VRM class III and IV areas and could indirectly lead to the protection of the more sensitive VRM class I and II areas where fuels treatments may be more restricted. Unplanned ignitions would be less likely to occur and spread in VRM class III and IV areas due to fuels reduction, thereby reducing overall short-term threat to VRM class I and II areas across the landscape. Fuel hazards may not be reduced in some VRM class I and II areas due to management restrictions based on scenic quality objectives. The threat of unplanned ignitions and spread of wildfire within these areas could remain high. In the short-term, smoke from prescribed fire in less sensitive VRM class III and IV areas could disperse across VRM class I and II areas and affect visual quality over the duration of the fuels or vegetation treatment.

Site-specific fire management activities would cumulatively contribute to better ecosystem conditions and the reduction of fire hazards across the landscape. This could lead to broad-scale sustained ecosystems and scenic aesthetics. Activities on public land, including recreational use, carry the risk of unplanned ignitions and consequential wildfire that could impact scenic quality. Other management activities on public land or adjacent lands not related to fire management could equally impact scenic quality. The proposed adaptive management approach to managing fire and fuels on public land could, in part, reduce cumulative impacts through designation of Fire Management Categories, establishment of long-term goals, and emergency stabilization and rehabilitation of areas burned by wildfire (Appendix A.5).

Special Designation Areas

Under the Proposed Action, potential direct impacts on Special Designation Areas would be limited to plant mortality and removal of organic matter in defined areas of treatment. The Proposed Action would rigorously seek to avoid alteration of the natural character of Special Designation Areas, by maintaining or restoring the native vegetation of an area and by limiting the construction of temporary roads and trails. Depending upon the type of Special Designation Area being managed under this Alternative, the use of mechanized tools would be carefully limited to the minimum necessary to accomplish the resource management objectives. Treatments would be carefully planned to maintain the natural or cultural character of Special Designation Areas.

Indirect impacts from the Proposed Action may include mortality to resident animal life in defined areas of treatment. Smoke from prescribed fires may indirectly impact a variety of resources, including wildlife and visitors to these Special Designation Areas. Indirect impact from smoke would be temporary. The Proposed Action may initially increase runoff and erosion, thus indirectly impacting riparian ecosystems and water quality downstream of treatment areas. Finally, the use of prescribed fire, chemical treatment, and biological treatment would have some potential to affect areas outside of those targeted.

The No Action Alternative has altered many Western ecosystems, where fire exclusion is widely believed to have contributed to overcrowded and unhealthy forests and shrublands. In these settings, dense fuel loads exist and catastrophic wildland fires are a result. The Proposed Action would seek to change this situation. Thus, a cumulative impact in Special Designation Areas could include the alteration of vegetative composition and structure at the landscape level, over time. This could lead to alteration of ecological function of these areas as fire returns to its historic role. This type of cumulative impact would be beneficial over the long-term.

Land Uses

Under the Proposed Action, the Desired Future Conditions would be achieved over the next 20 to 40 years. As the Fire Regime Condition Class situation is improved, there would be fewer adverse affects to land uses from high severity wildfires. There would be less need for emergency post-fire stabilization and rehabilitation to control soil erosion. Less wildlife habitat would be lost, and there would be more capacity for livestock grazing. The continuing trend of development in the WUI areas is expected, but with the reduction of hazardous fuels, the risk of wildfire loss would decrease.

Over the long-term, livestock grazing would be more productive under this Alternative, as forage improves. In the short-term, livestock grazing would be disrupted as a result of prescribed

burns and wildland fire use, because of the need to rest the land for at least two growing seasons until forage is re-established. However, the disruption could be planned in advance as treatments were planned, and ranchers would therefore be able to anticipate disruptions. It would be necessary to work closely with grazing permittees to minimize the economic impacts of fuels treatments over the short-term.

Forest land includes ponderosa pine forest, pinyon-juniper woodlands, and some mixed conifer and deciduous woodlands (see Table 3.10). Forest products are limited currently to firewood and fence posts. The Proposed Action would reduce hazardous fuels in these areas while maintaining the sustainable harvest of forest products. Improvements in public land health would also improve forestry resources. The Proposed Action would decrease the possibility of wildland fires caused by recreationists through reducing fuel loads. This Alternative would reduce the risk of fire to mineral resources by reducing the occurrence of catastrophic fire through hazardous fuel reduction and improvements in public land health.

Socio-Economic Conditions

Under the Proposed Action, the Desired Future Conditions would be achieved gradually over 20 years or longer. As the Desired Future Conditions are achieved and a more natural fire regime is established over time, there would be fewer economic losses from large, unplanned, catastrophic wildland fires. The reduction of hazardous fuel loads would reduce the risk of a wildland fire crossing boundaries onto private land or land administered by other agencies. As a result, overall safety for the general public and potential fire hazard conditions facing fire personnel would be greatly improved. Over the long-term, the Proposed Action would enhance public and firefighter safety by reducing the number and extent of catastrophic wildfires, reducing the number of homes and other property destroyed by catastrophic wildfires, and reducing the need for firefighters and wildfire suppression equipment and support services. This change would decrease the income of firefighters and companies that support wildland fire suppression (air tankers, equipment, logistics, etc.), since there would be fewer large wildland fires. This change would be long-term and permanent.

Direct impacts from increased use of prescribed fire, and chemical, mechanical and biological fuels treatment would be primarily short-term and temporary, although fuel reduction treatments would need to be repeated every few years. The Proposed Action would incur higher annual treatment costs to the BLM. These higher treatment costs would result in new opportunities for contractor-provided treatment support services, partially offsetting lost revenue from reduced wildland fire suppression service contracts.

During prescribed fires, direct impacts would include altered transportation patterns, altered sense of place, and impacts to subsistence activities. If over the long-term, the public perceives an improvement in wildland fire management, people that were dissuaded from moving into WUI areas due to hazards from catastrophic wildland fires might be more likely to move; thus, the Proposed Action might indirectly support increased movement into WUI areas. Wildfire suppression monies circulating through the region would be reduced, but replaced at a lower amount by monies from chemical, mechanical, and biological treatments, or prescribed fire equipment and support services.

Environmental Justice

The Proposed Action would not disproportionately affect any particular population negatively, although it would provide additional jobs to low-income segments of rural populations through

small-scale woodcutting and mechanical thinning contracts. Environmental effects such as air quality would affect the area's population equally, without regard to ethnicity or income level. No indirect impacts are expected. No cumulative impacts are expected.

Cumulative Impacts

Over the long-term, the Proposed Action would result in the return of large portions of the landscape to historical fire return intervals, and would thus decrease the potential for severe wildland fires and the need for fire suppression. The long-term absence of severe wildland fires would improve air quality and soil condition through lack of smoke and erosion linked with wildland fires. Water resources would not be affected over the long-term. Vegetation would approach historical conditions, and wildlife habitat would improve. Cultural and paleontological resources would sustain less damage because of the decreased need for fire suppression activities. Forage for wildlife and livestock would increase. Communities would lose income related to fire suppression, but would gain income related to the increased level of vegetation treatments.

MECHANICAL EMPHASIS ALTERNATIVE

Air Resources

In comparison with the No Action Alternative, the Mechanical Emphasis Alternative would have fewer air quality impacts due to smoke, but would produce more impacts from exhaust, dust, and noise from the use of mechanical equipment. This Alternative would improve air quality, but would limit the opportunities to use all the means of disposal and reduction of biomass that are currently available. This Alternative would support the Regional Haze Rule in the use of treatment Alternatives to fire and the use of emission reduction techniques (chemical, biological, and mechanical). The Regional Haze Rule requires states to show reasonable progress to the Environmental Protection Agency (EPA) in emissions reductions over time, and this Alternative would provide the maximum emissions reductions from fire.

Soil Resources

Treatments associated with this Alternative would have the greatest impact on soil due to the use of heavy equipment in mechanical treatments of fuels. In addition, road building would increase on a percentage basis on woodlands, shrublands, and forests.

Water Resources

Treatments proposed under this Alternative would likely have the greatest impact on short-term water quality. This would be due to the greater effect of heavy equipment used in mechanical treatments on soils and watersheds. The use of heavy equipment on a greater number of acres would also require more roads to support the movement of equipment, adding to the expected soil compaction and creating artificial drainage pathways for runoff, which would promote the generation of soil erosion, increase channelization of drainage ways, and increase sediment delivery to streams. Strict adherence to the site-specific BMPs, monitoring, and modification of BMPs would be necessary to keep such potential problems from occurring.

Besides the greater short-term impacts on water quality from the Mechanical Emphasis Alternative, the amount of watershed condition improvement to be expected under this

Alternative would only be slightly better than under the No Action Alternative. This would be due to the emphasis on using methodologies that would be initially more damaging to watershed condition. Recovery from the treatment would take longer than from less impacting treatments, providing for a longer lag time before the watershed could move toward a better condition. Because of this, any changes to water quality and water yield would be similar to the No Action Alternative level of change.

Vegetation Resources

Under the Mechanical Emphasis Alternative, an annual average of two to three times the acres would be treated as under the No Action Alternative. The treatment of fuels by mechanical methods would increase from the current average of 25 percent under the No Action Alternative to an average of 60 percent. Prescribed burning and chemical treatments would increase by a small margin, and biological treatments would remain the same. This Alternative would have the greatest short-term impacts on vegetation, as a greater percentage of the landscape would be treated by machinery. Some vegetation would be damaged or destroyed in treatment areas; soil would be compacted.

Mechanical treatment would temporarily increase fuel loading by creating slash as a result of mechanical treatments, but would remove larger fuels and material if wood products are marketed as a result of contracts to perform fuel reduction. The use of prescribed burning would be largely limited to treating the fuels that were generated as a result of mechanical treatments. After the treatments are completed, fire would be used to maintain the landscape.

Invasive and Noxious Weeds

Under the Mechanical Emphasis Alternative, the emphasis on mechanical fuels treatments would increase the risk of invasion of non-native vegetation from the current condition under the No Action Alternative. The use of BMPs or a weed management plan incorporated in treatment contracts would mitigate the spread of weeds. The use of fire would be reduced and in turn, fewer acres would be treated compared to the Proposed Action.

Fish and Wildlife Resources

Compared with the No Action Alternative, the greater proportion of mechanical treatments under this Alternative would result in soil compaction, damaging the subterranean habitat used by burrowing animals. However, mechanical treatments would be beneficial for wildlife if the treatment areas were arranged in strips and patches and if methods were selected that increase browse and forage availability. Mechanical activities would have much greater spatial flexibility; they could be modified to avoid a nest or to move activities from an area where a sensitive species is found. Therefore, one of the major advantages of this Alternative would be that treatments could be selectively designed to address wildlife issues and needs. Mechanical treatments could still cause disturbance and displacement as well as changes in habitat conditions. Any changes in the vegetative conditions could result in habitat modifications that would make the landscape unsuitable for an indeterminate time for certain species.

Special Status Species

The impacts to special status species under the Mechanical Emphasis Alternative would be the same as under the Proposed Action.

Cultural Resources

In comparison with the No Action Alternative, impacts to cultural resource sites would be less likely to occur under the Mechanical Emphasis Alternative. Impacts to cultural resource sites would have to be considered in the planning process prior to implementing mechanical treatments. Cultural resource inventories of mechanical treatment areas would be conducted, and appropriate avoidance or mitigation strategies incorporated to prevent impacts to sites. Greater reliance on mechanical methods for fuel reduction would reduce the overall acreage treated, and steeper slopes would not allow for treatment in some areas, which would limit potential benefits to cultural resource sites because of the relatively greater risk of wildfire under this Alternative.

Paleontological Resources

Impacts to paleontological resources under the Mechanical Emphasis Alternative would be less severe than under the No Action Alternative. Project planning for fuel reduction treatments would consider potential impacts to fossil localities. The avoidance of known or identified fossil locations from mechanical treatment projects could reduce the overall extent of treatment accomplished from that of the Proposed Action. Instead of avoiding fossil locations, specimens could be recovered prior to treatment; while entailing more cost, this would mitigate any potential impacts.

Visual Resources

Impacts under the Mechanical Emphasis Alternative would be less than those under the No Action Alternative due to the decreased risk of severe wildland fire, but similar to those under the Proposed Action and the Fire Emphasis Alternative. Impacts would vary by degree depending on the type of treatment and the extent of the treatment. For example, mechanical treatment to reverse juniper encroachment into a grassland or shrubland would impact scenic quality if all or nearly all trees are removed. This impact would be exacerbated if dead trees were left on site. Either chipping or burning downed trees on site could lessen the impact. Whether using mechanical, fire, biological or chemical treatments, impacts would be greater in a Class I or II area and less in a Class III or IV area.

Special Designation Areas

Under the Mechanical Emphasis Alternative, impacts to Special Designated Areas would be less than under the No Action Alternative due to the decreased risk of severe wildland fire, but similar to those under the Proposed Action. Impacts would vary by degree, depending on the type of treatment and extent of the treatment. Larger treatment areas would impact the naturalness of the Special Designated Areas in the short-term. In the long-term, treatments would improve the historic naturalness of these areas. In the short-term, vegetation treatments could impact the visitor's recreation experience or could possibly preclude recreation use of areas for short periods of time. In the long-term, the recreation experience would be improved through the treatment producing a more natural setting.

Land Uses

The Mechanical Emphasis Alternative would have a greater impact on forestry land use than on other land uses since the focus would be to treat more forest and woodlands with mechanical

methods. This Alternative would lead to the integration of fuels management and forestry in developing wood product contracts and perhaps developing an increase in wood product values.

Socio-Economic Conditions

Under the Mechanical Emphasis Alternative, more monies for mechanical treatments would be available than under the No Action Alternative or the Proposed Action. Since mechanical treatments tend to be more expensive than prescribed burns, more money would enter local economies through mechanical thinning contracts and through local employees hired to carry out mechanical treatments. On the other hand, fewer acres would be treated than under either the Proposed Action or the Fire Emphasis Alternative; thus there would be a greater risk of catastrophic wildland fire than under these Alternatives, but less risk than under the No Action Alternative. Under the Mechanical Emphasis Alternative, there would be less prescribed burning and consequently fewer direct impacts from prescribed burns, including fewer impacts on subsistence activities that depend on forage, such as livestock grazing.

Environmental Justice

The Mechanical Emphasis Alternative would not disproportionately affect any particular population negatively, although it would provide additional jobs to low-income segments of rural populations through small-scale woodcutting and mechanical thinning contracts. Environmental effects such as air quality would affect the area's population equally, without regard to ethnicity or income level. No indirect impacts are expected. No cumulative impacts are expected.

Cumulative Impacts

Under the Mechanical Emphasis Alternative, long-term effects would include improved air quality because of the decreased occurrence of severe wildland fires and prescribed burning, and impacts to soil and watershed health due to soil disturbance and compaction caused by increased use of heavy equipment. Local economies would benefit from treatment contracts and biomass use, but would lose benefits from fire suppression activities.

FIRE EMPHASIS ALTERNATIVE

Air Resources

The Fire Emphasis Alternative would produce more impacts to air quality than the No Action Alternative. Since the Fire Emphasis Alternative concentrates on fire use, the use of other treatments and emission reduction techniques would be limited, and increased emissions would be produced from prescribed burning. The Fire Emphasis Alternative does not provide for a reduction in emissions; therefore the Regional Haze Rule mandate of emission reductions would not be achieved to the maximum extent feasible. There is also a chance that emissions would rise under this Alternative since pretreatment of fuels would be limited, and other treatment Alternatives would not be considered to the fullest extent possible.

Soil Resources

Under this Alternative, the occurrence of catastrophic wildfires would decrease over time in comparison with the No Action Alternative, as fuel loads decline. Reducing severe wildfires

would protect soils from long-term damage and degradation of the soils' properties, fertility, and structure. Frequent, low-temperature fires would have fewer and shorter-lived effects on soils (McNann, et al, 1990). However, more acres would be subject to soil erosion as a result of prescribed burning. This Alternative would achieve soil-related benefits on the greatest number of acres, compared with the No Action Alternative, but only if prescriptions for prescribed fire and wildland fire could be achieved.

Water Resources

Impacts to water resources under the Fire Emphasis Alternative would be less than those for the No Action and Mechanical Emphasis Alternatives but greater than those for the Proposed Action. Despite the greater amount of acres to be treated with prescribed fire, the effect on short-term water related impacts would be less than the impacts from mechanical treatments on fewer acres. This is because the prescribed fire techniques would disturb soil resources less than the mechanical approach.

Long-term beneficial impacts to watershed conditions would likely be less than under the Proposed Action because of the emphasis on the use of prescribed fire when another treatment approach might be more appropriate. As with the Proposed Action, overall water quality conditions or water yields would not be expected to be measurably affected by this Alternative.

Vegetation Resources

The Fire Emphasis Alternative would treat five times the acres treated under the No Action Alternative. Grasslands and woodlands would primarily be treated with the use of fire. Impacts may include inadvertent damage to desirable plants. The fire use emphasis would create some vegetation effects that are not selective and exceed prescription parameters. Note, however, that the current vegetation condition class may not allow the exclusive use of fire until mechanical manipulation of fuels is implemented. This Alternative would generally cost less per acre, would not generate as much volume of wood products as the Proposed Action or the Mechanical Emphasis Alternative, and would meet resource objectives only if the prescriptions of individual burn plans or fire use plans could be met.

Invasive and Noxious Weeds

The Fire Emphasis Alternative would increase the amount of bare ground and soil erosion compared to the No Action Alternative; and as a result weed populations would increase. These risks would be mitigated through proper planning and adherence to the BLM policy on Emergency Stabilization and Rehabilitation. Under proper conditions and prescriptions, this Alternative would treat more acres than the Proposed Action or Mechanical Emphasis Alternative, but with greater risks for increased invasive and noxious weeds.

Fish and Wildlife Resources

Under the Fire Emphasis Alternative, wildland fire would be used for resource benefit much more frequently than under the No Action Alternative, and some areas would likely burn at higher than natural intensities due to current levels of fuel accumulation, even when prescriptions were designed to minimize these effects. As a result, the removal of large woody debris and shrub cover (which provide habitat diversity) would be greater than typically found within the natural range of variation for an area, while the creation of habitat mosaics would be

less than typical. The loss or alteration of these habitat components would adversely affect species that favor dense habitat types; or bird species that favor heavy shrub cover in shrub or chaparral habitats. Wildlife species would experience direct mortality or displacement from these managed fires, particularly in years of extensive burning or higher-intensity burns before fuel loads are reduced. Still, effects to wildlife species would be greatly reduced from the No Action Alternative, where severe wildland fires would have unplanned consequences.

In years of extensive wildland fire use, large areas of habitat would likely be affected, changing their suitability for species favored under the altered habitat conditions created by a history of fire suppression. Some species occupying burn sites would show an initial decline in populations immediately following a fire, but would recover quickly with the early successional recovery of the habitat or would recolonize the burned site (Smith 2000, Cunningham et al 2001). Conditions for prescribed fires would also vary among years, with little burning occurring in some years, and more burning occurring in others. As a result, there would likely be direct effects to fish and wildlife resources from prescribed fires. In addition, escaped prescribed burns could accidentally cause damage to riparian habitats and impact aquatic resources, causing losses of wildlife and fish through exposure, total loss of habitat, and through increased sedimentation of aquatic habitat through unchecked overland flow and destabilized stream channels. The use of prescribed fire under proper conditions would improve forage quality and quantity, intersperse new feeding areas with areas providing cover, and rejuvenate decadent browse plants over much larger areas of the landscape than under the No Action Alternative.

Special Status Species

Impacts to special status species under the Fire Emphasis Alternative are the same as under the Proposed Action.

Cultural Resources

Impacts to cultural resource sites are less likely to occur under the Fire Emphasis Alternative than under the No Action Alternative, but more likely to occur than under the Proposed Action or the Mechanical Emphasis Alternative. Impacts to cultural resource sites would be considered in the planning process prior to implementing prescribed fires. Cultural resource inventories of prescribed fire areas would be conducted and appropriate avoidance or mitigation strategies incorporated to reduce impacts to sites. Greater reliance on prescribed fire methods for fuel reduction would increase the overall acreage treated, with the drawback that unexpected events such as a fire escape could compromise cultural resource sites outside of planned project areas. Hand treatment would be required to eliminate fuels in the vicinity of some sites to reduce the direct effects of prescribed fire. Avoidance of high site density areas may be necessary, which would in turn reduce some acreage that could be treated by prescribed fire.

Paleontological Resources

Impacts to paleontological resources under this Alternative would be less likely to occur than under the No Action Alternative, but comparable to those for the Proposed Action and the Mechanical Emphasis Alternative. The extensive use of prescribed fire under this Alternative would reduce the potential for heavy equipment damage to paleontological resources, and would increase the potential for post-treatment erosion which might expose or impact fossil specimens. Project planning and pre- and post-treatment inspections would reduce impacts

from prescribed fire; areas with high potential for fragile paleontological localities would be avoided.

Visual Resources

Impacts under the Fire Emphasis Alternative would be less than under the No Action Alternative, and similar to those under the Proposed Action and Mechanical Emphasis Alternative. Short-term impacts would vary by degree depending on the type of treatment and the extent of the treatment. For example, the impact of using fire to reverse juniper encroachment into a grassland or shrubland would be proportional to the amount of area burned, the number of dead trees left standing and the pre-treatment visual class of the area. Whether using mechanical, fire, biological or chemical treatments, impacts would be greater in a Class I or II area and less in a Class III or IV area. Long-term impacts may include a change in the character of some landscapes by returning the natural fire return interval.

Special Designation Areas

Under the Fire Emphasis Alternative, impacts to Special Designated Areas would be less than under the No Action Alternative, and similar to those under the Proposed Action. Impacts would vary by degree, depending on the type of treatment and extent of the treatment. Larger treatment areas would impact the naturalness of the Special Designated Areas in the short-term. In the long-term, treatments would improve the historic naturalness of these areas. In the short-term, vegetation treatments could impact the visitor's recreation experience or could possibly preclude recreation use of areas for short periods of time. In the long-term, the recreation experience would be improved through the treatment producing a more natural setting.

Land Uses

Forest health would improve under this Alternative in comparison to the No Action Alternative. However, because fewer acres of forests and woodlands would be treated with mechanical treatments under this Alternative, forest health would not improve as much as under the Proposed Action or Mechanical Emphasis Alternative, and there would be a slight negative impact to forestry compared to these Alternatives. The Fire Emphasis Alternative would improve woodland and rangeland health, but would not yield selective results since fire use is non-selective in reducing tree density. This Alternative is similar to the No Action Alternative in the disruption of livestock grazing and mineral exploration and extraction over the short-term, by the need to rest the land after fire until forage is re-established or land conditions improve. Over the long-term, livestock grazing would be the most productive under this Alternative, because more acres would be burned and forage would improve over a greater area, but only if burn prescriptions could be achieved.

Socio-Economic Conditions

Under the Fire Emphasis Alternative, more monies for prescribed burns would be available than under the No Action Alternative. Since prescribed burns tend to be less expensive per acre than mechanical treatments and since BLM employees often conduct them, less money would enter local economies through mechanical thinning contracts and through local employees hired to carry out mechanical treatments than under the Proposed Action or the Mechanical Emphasis Alternative. On the other hand, more acres would be treated than under either the Proposed

Action or the Mechanical Emphasis Alternative. Under the Fire Emphasis Alternative, there would be more prescribed burning and consequently more direct impacts from prescribed burns and from wildland fire use, including more impacts on subsistence activities that depend on forage, such as livestock grazing. On the other hand, forage is projected to improve over the long-term, which would be a benefit to grazing permittees.

Environmental Justice

The Fire Emphasis Alternative would not disproportionately affect any particular population negatively. Environmental effects such as air quality would affect the area's population equally, without regard to ethnicity or income level. No indirect impacts are expected. No cumulative impacts are expected.

Cumulative Impacts

Over the long-term, the Fire Emphasis Alternative would impact air quality through increased emissions from prescribed fire and wildland fire use. Impacts could be similar to those of the No Action Alternative, but prescribed fires would be planned to minimize impacts on air quality. More forage would be increased under this Alternative over the long-term, if burn prescriptions could be met. Communities would benefit less from fire suppression activities and from economic gain related to fuel reduction treatments, since prescribed burns typically require less manpower than other treatments.